REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-14 are now pending in this application. In the outstanding Office Action, Claims 1-3 and 5-12 were rejected under 35 U.S.C. §103(a) as obvious over Shinya, JP 2004-083563. Claim 4 was rejected under 35 U.S.C. §103(a) as obvious over Shinya in view of Yasuo, JP 2002-107497. Claims 13 and 14 were rejected under 35 U.S.C. §103(a) as obvious over Shinya in view of Ikarashi, U.S. Patent No. 5,115,329.

Claims 1-3 and 5-12 were rejected under 35 U.S.C. §103(a) as obvious over Shinya, JP 2004-083563. Applicant respectfully traverses these rejections, as the Office has failed to state a prima facie case of anticipation.

Claim 1, from which claims 2, 3, and 5-12 depend, is directed to a fluorescent conversion medium. The conversion medium comprises fluorescent particles and a transparent medium holding the fluorescent particles dispersed therein. The fluorescent particles comprise semiconductor nanocrystals and absorb visible light to emit fluorescence of a different wavelength.

Shinya teaches that the light emitted by the fine particle crystal depends on the volume of the crystal. *See* ¶ 0013. Shinya further teaches that the wavelength range of the secondary light is adjusted by setting the volume distribution of each fluorescent particle to a specified value. *See* Abstract. Indeed, the object of the Shinya invention is to adjust the wavelength of the light emitted from the fluorescent particles by setting the volume of of the fluorescent particles. Contrary to Shinya, the present invention is directed to enhancing fluorescent conversion efficiency, not adjusting the wavelength of the emitted light.

The present invention differs from Shinya in several important ways. Shinya discloses a fluorescent medium with fluorescent particles. The fluorescent medium is glass or acrylic. *See* ¶¶ 42 and 43. As noted in ¶ 43, the fluorescent particles are applied or coated onto the glass or acrylic medium. This is different from the presently claimed invention, in which the fluorescent particles are dispersed within the transparent medium.

Further, as noted in the Office Action, Shinya does not teach that the medium holding fluorescent particles must satisfy the inequality $0.4 < C \cdot d/r^3 < 5.0$. In the present invention, the average diameter of the particles, the film thickness of the fluorescent conversion medium, and the volume ratio of the particles to the fluorescent conversion medium in the present invention have a specified relationship, i.e., the conversion medium satisfies the inequality $0.4 < C \cdot d/r^3 < 5.0$, in which r is the average diameter in nm of the fluorescent particles, d is the film thickness in μm of the fluorescent conversion medium, and C is the volume ratio in volume % of the fluorescent particles to the fluorescent conversion medium. Applicant discovered that maintaining this specified relationship results in improved efficiency of conversion of visible light to fluorescent light, as illustrated in Table 3 of the present application, at page 57. Examples 1-9 met this criteria, and had conversion efficiencies of 51.5%, 52.9%, 32.1%, 108.0%, 65.9%, 48.9%, 42.7%, 96.7%, and 81.4%, with a mean value of 59.7%. Comparative Examples 1-8 did not meet this criteria, and had conversion efficiencies of 42.3%, 13.7%, 99.6%, 34.8%, 28.4%, 35.7%, 95.6%, and 23.4%, with a mean value of 46.6%. Further, Examples 1-9 -- meeting the specified criteria-- showed good red or green emission properties, while Comparative Examples 1, 3, 4, 5, 7, and 8 showed insufficient red or green emission properties.

The Office asserts that Shinya teaches an average diameter of fluorescent particles of 4 nm in ¶ 0052. Applicant respectfully disagrees. Instead, Shinya only teaches that the "quantum size effect becomes large in the range smaller than about 8 nm in diameter." ¶

0013. The Office further asserts that Shinya describes the weight ratio of fluorescent particles in a fluorescent conversion medium in ¶¶ 26 and 32. Applicant respectfully disagrees. These paragraphs only teach that the fluorescent particles are mixtures of Group III elements and Group V elements, and that it is preferred that the ratio of In in the Group III elements is 50% or more, and the ratio of nitrogen in th Group V elements is 95% or more. Further, the paragraphs cited teach nothing about particular ratios of substances resulting in a high degree of brilliance. Lacking any teaching of preferred sizes and ratios, Applicant respectfully submits that the disclosure in Shinya is insufficient to teach or suggest providing a conversion medium comprising fluorescent particles and a transparent medium holding the fluorescent particles dispersed therein with the specified relationship between the average diameter of the particles, the film thickness of the fluorescent conversion medium, and the volume ratio of the particles to the fluorescent conversion medium. Moreover, given the fact that the object of the Shinya invention is to foster the adjustment of the wavelength of the light emitted from the fluorescent particles, there is clearly no articulated reasoning why the claimed medium, meeting the required inequality, would be obvious. Lacking such reasons, claim 1, and claims 2, 3, and 5-12 depending therefrom, cannot be obvious over Shinya. Applicant respectfully requests withdrawal of these rejections.

Regarding claim 5, the Office asserts that Shinya teaches the fluorescent conversion part of claim 1 provided on a transport support substrate, with its disclosure of a fluorescent substance applied to a transparent board-shaped object in ¶ 42. As noted above, Shinya does not, in fact, teach or suggest the fluorescent conversion part of claim 1. Shinya teaches simply applying fluorescent material to a transparent plate. Claim 5, on the other hand, requires that the fluorescent conversion part comprises the fluorescent conversion medium of claim 1, which has fluorescent particles dispersed therein. Applicant respectfully requests withdrawal of the rejection of claim 5.

Claim 4 was rejected under 35 U.S.C. §103(a) as obvious over Shinya in view of Yasuo, JP 2002-107497. Applicant respectfully traverses this rejection, as the Office has failed to state a prima facie case of obviousness. Claim 4 depends from claim 1, and includes all of the elements of claim 1. As noted herein, Shinya does not disclose or suggest a fluorescent conversion medium satisfying the inequality $0.4 < C \cdot d/r^3 < 5.0$. Nor does Yasuo disclose a fluorescent conversion medium satisfying the inequality $0.4 < C \cdot d/r^3 < 5.0$. Accordingly, the combination of Shinya and Yasuo fails to teach or suggest the elements of the claimed fluorescent conversion medium. Moreover, there is no articulated reasoning why the claimed medium, meeting the required inequality, would be obvious. Lacking such reasoning, claim 4 is not rendered obvious by the recited combination. Applicant respectfully requests withdrawal of this rejection.

Claims 13 and 14 were rejected under 35 U.S.C. §103(a) as obvious over Shinya in view of Ikarashi, U.S. Patent No. 5,115,329. Applicant respectfully traverses this rejection, as the Office has failed to state a prima facie case of obviousness. Like claim 4 above, claims 13 and 14 depend from claim 1, and include all of the elements of claim 1. Both are directed to "the fluorescent conversion medium according to claim 1..." Claim 13 further indicates that certain types of crystals may be selected for the semiconductor nanocrystals. Claim 14 further indicates that certain materials may be used to form the transparent medium.

Claims 13 and 14 cannot be obvious over Shinya and Ikarashi because Shinya does not disclose or suggest a fluorescent conversion medium satisfying the inequality $0.4 < C \cdot d/r^3 < 5.0$, and because there is no articulated reasoning why the claimed medium, meeting the required inequality, would be obvious. Further, Ikarashi does not remedy the deficiencies of Shinya. Ikarashi generally teaches an apparatus including a light source and a fluorescent converting medium. The light source has an organic emitting layer. The organic

emitting layer of the light source includes fluorescent powders and resins. This is distinguished from the present invention, in that the fluorescent powders and resins are part of the fluorescent conversion medium in the present invention, not part of the light source. One skilled in the art would not be motivated to include the claimed fluorescent powders and resins in the fluorescent conversion medium by the Ikarashi disclosure. Accordingly, claims 13 and 14 cannot be obvious over the combination of Shinya and Ikarashi. Applicant respectfully requests withdrawal of these rejections.

In light of the above discussion, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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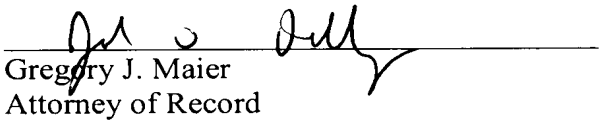

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